



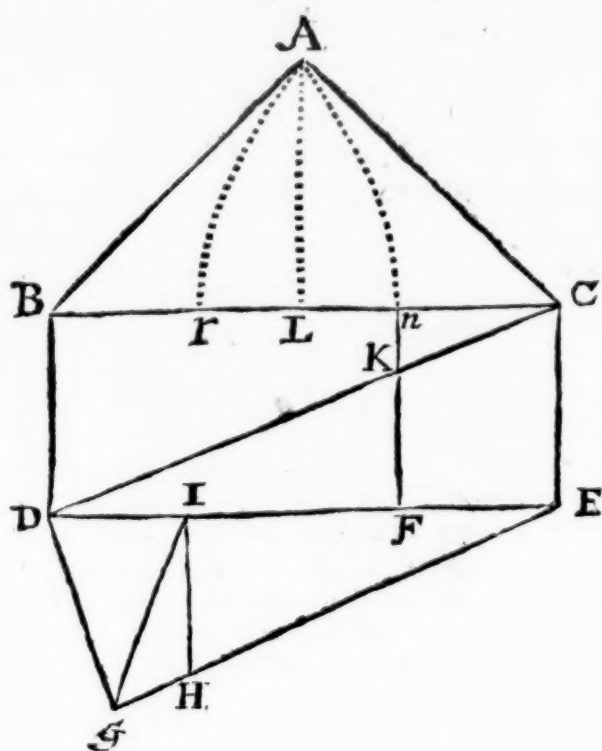
The Athenian Mercury:

Saturday, June 3. 1693.

We shall here according to our Promise some time since, endeavour the Resolution of the best of those Mathematical Theorems and Problems which have been sent in unto us, and tho we have (to save what Charge We could to the Bookseller) put six Questions in to one Diagram, We shall take care to treat of 'em with that distinction, as will give the Reader no more trouble than if every Question had its particular Diagram affixt to it.

Quest. 1. **L** Et ABC be a right-angled Triangle, and BL a Segment of the Base made by letting fall the Perpendicular AL.

AC = b = 2.425 } given. The side AB = a
BL = c = 1.73. } requir'd?



Ans. This Question is much more easie than some of the following, since the Base and perpendicular are equal, this Triangle being an Isosceles: But We shall wave that Consideration, and work to find a general Theorem upon a contrary Supposition, since all Right-angled Triangles that have a Perpendicular let fall upon their Base, and have only any 2 sides given out of the 5. may easily have their Solution:

As $c : a :: a : \frac{aa}{c} = BC$: and $\frac{aa}{c} - c = \frac{aa - cc}{c}$
= L.C the Square, of which is $\frac{aaaa - 2aacc + cccc}{cc}$
But $aa - cc = bb - \frac{aaaa - 2aacc + cccc}{cc}$
= $\frac{bbcc - aaaa + 2aacc - cccc}{cc}$.

That is, $aacc - cccc = bbcc - aaaa + 2aacc$,
- cccc. Hence also $aaaa - ccaa = bbcc$,
which when reduc'd gives $a = 2.4 +$.

Quest. 2. Let ABC be a Right-angled Triangle, as before,

Br = b = 1.05 } are given, rn is re-
Cr = c = 1.05 } quir'd?

Ans. By the 1 and 2 the Square of the parts of the Line BC are equal to the Square of the whole, also Bn being equal BA, and Cr equal CA, the Equation is $2bc = aa$, the Square Root of which is easily extracted.

Quest. 3. Let ABC be a Right-angled Isosceles Triangle, nC = m is only given, what is AB = a?

Ans. The Remainder of the Hypotenuse Bn being = a, also CA = CA, therefore by 47 and 1. $aa + 2am + mm = 2aa$, that is, $V. 2mm + m = a$.

Quest. 4. Suppose BF a Parallelogram, or Oblong Square,

BN = DF = b = 2.4 } are given, also when
BD = n F = c = 1.4 } BC is drawn an
infinite line KC =
d = 1.12 is given?

Now its requir'd to give a general Theorem for the length of the whole Diagonal DC, the length of KC being always first limited?

Ans. Let Z represent the whole Diagonal, then it will be

As $Z - d :: b :: \frac{db}{Z - d} = nC$, but $nC +$

$Bn = BC = \frac{zb}{Z - d}$.

But $zz - cc = \frac{zabb}{zz - 2zd + dd}$, or $zabb - zzzz$
- $2zzzd - zccc + zzzd - 2zccd - cddd$.

Hence this Equated Theorem,

$zabb - 2dzzz - cc$ } $zz - 2ccd - cddd$
+ dd }

Which Quadratic if reduc'd according to the late Methods of Converging Series, will give $Z = 3.7$ Proxime, d being included, Which was to be done.

Quest. 5. Let DKF, DCE be similar Right-angled Triangles,

CE = d }
KC = c } are given, what is the side DB = a?
DF = b }

Ans. As $a : b :: c :: \frac{bc}{a} = DK$, but $bc +$

$c = \frac{bc + ac}{a} = DC$, the Square whereof is

$\frac{bbcc + 2bcc + aacc}{aa} = \frac{bb + 2ba + aa + dd}{aa}$

(per

(per 47. e. i.) hence arises this equated Theorem,

$$aaaa + 2baaa + dd \left. \begin{array}{l} + bb \\ - cc \end{array} \right\} aa - 2bcca = bbcc.$$

Now supposing $c=15$. and $d=24$. and $b=20$; If this Equation be reduced into a Numeral Exegesis, those that will be at the labour will find $a=12$.

Quest. 6. Let DHE be a plain oblique angled Triangle, the Perpendicular HI falls within, and the Perpendicular DG falls without,

$$\left. \begin{array}{l} IE = d = 97 \\ GD = s = 68 \\ GH = b = 51 \end{array} \right\} \text{are given, HI} = a \text{ is requir'd?}$$

Ans. The Triangles EDG and EIH being similar, it will hold.

$$\text{As } a : d :: s : \frac{ds}{a} = GE. \text{ and } \frac{ds}{a} - b = \frac{ds - ab}{a} = HE, \text{ which squar'd gives } \frac{ddss - 2dsab + aabb}{aa}$$

$= dd + aa$ (per 47 e. i.) Hence this Equation,

$$aaa + dd \left. \begin{array}{l} + dd \\ - bb \end{array} \right\} aa - 2dsba = ddss, \text{ which reduced gives } a = 42 \text{ prop.}$$

There are some more Questions which we shall consider at some other time, and in the mean while should be glad to hold private Correspondence by Letters with any Ingenious Annalists.

Quest. 7. Pray Gentlemen, what is Chyle? and how made?

Ans. Chyle is a pretty thick white Juice, like Barley Cream, made out of the Aliments taken in this manner, while the Meat is chewing in the Mouth it is mix'd with the Saliva, which not only softens it, but endows it with a certain fermentative quality, unto which contributes also the Drink, (whether Bear or Wine, &c.) which often contains in it Acrimonious Particles, and fermentaceous Spirits. The Stomach by the help of its Fibres embraceth closely the Meat thus chewed and swallowed, and mixeth therewith specifick fermentacious Juices, bred in its inner Coat, and impregnated with the Saliva, then by a convenient Heat there is made a Mixture and Eliquation of all, for that the fermentaceous Particles entring into the Pores of the Meat, do pass through, agitate and eliquate its Particles, separating the purer from the Crails, and making them more fluid, so that they make another form of Mixture, and unite among themselves into the resemblance of a Milky Cream, after which together with the thicker Mafs with which they are yet involved, by the Constriction of the Stomach they pass down to the Guts, where by the Mixture of the bile and pancreatick Juice they are by another manner of fermentation quite separated from the thicker Mafs, and so are received by the Lacteal Vessels, as the thicker is ejected by Stool.

Quest. 8. How is the Chyle turn'd into Blood?

Ans. 'Tis done in this Manner, the Chyle out of the *Receptaculum Chyli* ascending by the *Ductus Thoracicus*, and flowing into the *Subclavian Vein*, together with the returning Venal Blood, is poured by the *Vena Cava* into the right *Auricle*, and so into the right Ventricle of the Heart in its Diastole or Relaxation, then by its Systole or Contraction it is driven from thence into the Lungs, from whence it ascends again into the left *Auricle* first, and then into the left Ventricle of the Heart, out of which it is Expelled through the *Aorta*, and passing

along with the Blood through the *Arteries* of the whole Body, returns again with it by the Veins to the Heart, for it undergoes many Circulations before it can be assimilated to the Blood.

'Tis evident from hence that if one let Blood 4 or 5 Hours (or later) after a full Meal there will a great quantity of the Milky Chyle it self swim atop of the Coagulated Blood.

Advertisements.

THis is to give Notice that Mr. Increase and Mr. Cotton Mather's New Discourse concerning the *New-England WITCHES and WITCHCRAFTS*, are now arriv'd, to which will be added the *Observations* of a Person who was upon the place 6 or 7 days, when the suspected WITCHES were first taken into Examination: As also an *APPENDIX*, giving an Account of the late Disposition of a Person in England by Fasting and Prayer; Printed by the Consent of the Minister chiefly concern'd, with a Preface to it by a Reverend Divine living in London. These being all *Licensed and Entered in the Hall-Book*, will be speedily Published. Printed for John Dunton at the Raven in the Poultry: Of whom is to be had Mr. Cotton Mather's *First Account* of the Tryals of the *New-England Witches*, Printed on the same size with this *Last Account* of Mr. Increase Mather's, that they might Bind up together.

ON Wednesday the 13th. and Thursday the 14th. of June, at the Outroppers-Office at the West End of the Royal Exchange in Cornhill, will be Sold by way of Mining, a Method not hitherto used in England, a Curious Collection of Paintings and Limnings, fit for Halls, Chimneys, Stair-Cases and Closets, being Pictures of the most Eminent Masters in Europe, viz. Titian, Tinocet, Rubens, Vandyke, Rembrant, Frank, Possein, Jordans, and several other great Masters, both Ancient and Modern, not here inserted. By Edward Millington. And all Persons that cannot come at the Time of Sale may Buy them at the Prizes now prefixt, either before or after. The Sale begins at Three of the Clock, to Sell by Day-light each Afternoon.

ELixir Stomachicum: Or, the great Cordial Elixir for the Stomach; of a delicate Flavour, and pleasant bitterish Taste: Not Purging, but Cordial only; to be drank at any time, (but especially in a Morning) in any Liquor, as Ale, Tea, Mum, Canary, White-Wine, A Dram of Brandy, &c. It makes the best Purl in the World in Ale, and in Canary, Tea, &c. very pleasant and wholesome, far exceeding Purl made of Wormwood, which (being so hot and drying) hurts the Sight, and dries the Blood very much: This having the Quintessence of all the Ingredients of the bitter Draught in it, and many other excellent Stomachicks brought into a small quantity, as that 30 or 40 Drops is a Dose; you may make it at your pleasure in a Glass of White-Wine, Tea, or other Liquor; it procures a good Appetite, helps Digestion, expels all Wind, Strengthens the Stomach, purifies the Blood, and destroys the Scurvy, with many other Virtues mentioned in the Bills given with it; but these six things (especially) it does beyond belief, without your experience in. Price One Shilling each Bottle.

It is to be Sold by Mr. John Dunton at the Raven in the Poultry; and at these Coffee-houses, viz. Symonds-Inn in Chancery-Lane, at Vigore's in the Old Pallace-Yard, Westminster, Victualling-Office at Tower-Hill, Man's at Charing-Cross, Essex at Whitechappel, North's in King-Street by Guild-Hall, Richard's at Temple-bar, Smythers in Thames-Street, Will's in Covent Garden, Blacketts at Spittle-fields, Wells at the Postern in Aldermanbury, John's in Fuller's Rents, Buckeridge's without Aldersgate, Hamet's on London-bridge, Brown's at Wapping Old-fairs, John's by the Kings-bench, Jonathan's in Exchange Alley, Smith's at Lambeth, by the Church, Cleve's at Greenwich, by the Church; by Mr. Tho. Collet Jun. near the Hermitage, Tobacco-nist; Mr. Leavinston, Fruiterer at the Royal Exchange, and Tho. Howkins in George-yard in Lombard-Street.